Dansk standard

DS/EN 62552
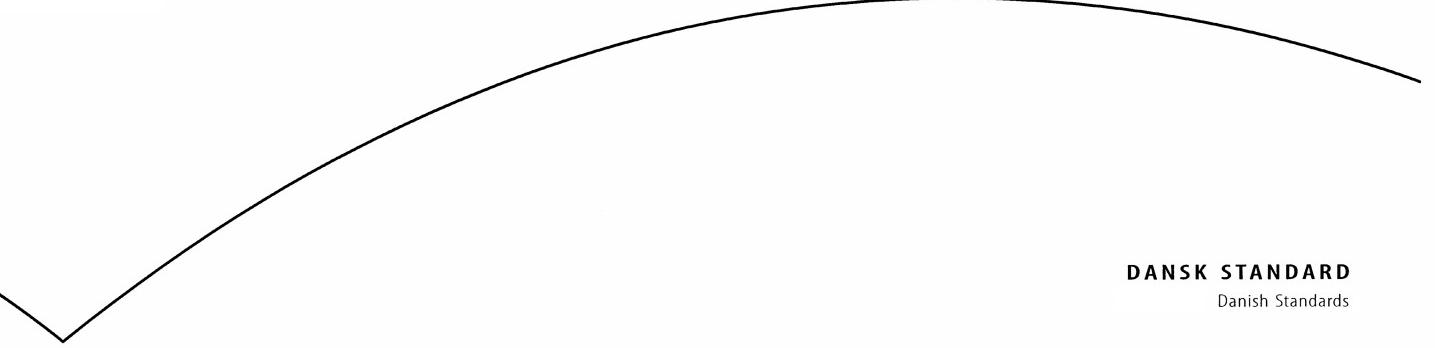
1. udgave

2013-05-03

Køleapparater til husholdningsbrug – Karakteristika og prøvningsmetoder

Household refrigerating appliances – Characteristics and test methods

DANSK STANDARD

Danish Standards

DS/EN 62552

København
DS projekt: M254892
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MOD med: IEC 62552 ED 1.0:2007.
IDT med: EN 62552:2013.

DS-publikationen er på engelsk.

Denne publikation erstatter: DS/EN ISO 15502:2005, DS/EN ISO 15502/AC:2007 og DS/EN 153:2006.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62552

March 2013

ICS 97.030

Supersedes EN 153:2006, EN ISO 15502:2005 + corr. Dec.2007

English version

Household refrigerating appliances - Characteristics and test methods
(IEC 62552:2007, modified + corrigendum Mar. 2008)

Appareils de réfrigération à usage
ménager -
Caractéristiques et méthodes d'essai
(CEI 62552:2007, modifiée + corrigendum
Mar. 2008)

Haushalt-Kühl-/Gefriergeräte -
Eigenschaften und Prüfverfahren
(IEC 62552:2007, modifiziert +
corrigendum Mar. 2008)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
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Ref. No. EN 62552:2013 E

Foreword

This document (EN 62552:2013) consists of the text of IEC 62552:2007 + corrigendum 2008 prepared by IEC/TC 59 "Performance of household and similar electrical appliances", together with the common modifications prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement   (dop)   2013-10-22
- latest date by which the national standards conflicting with this document have to be withdrawn   (dow)   2015-10-22

This document supersedes EN 153:2006 and EN ISO 15502:2005 + AC:2007.

EN 62552:2013 includes the following significant technical changes with respect to EN 153:2006 and EN ISO 15502:2005:

– new compartment: zero star;

– new compartment: wine storage, combined with requirements for vibration, temperature fluctuation and humidity;

– new compartment: pantry;

– new compartment: multi-use;

– new compartment: through-the-door-devices;

– requirements for circumvention.

EN ISO 15502:2005 + AC:2007, *Household refrigerating appliances – Characteristics and test methods*, is based on ISO 15502:2005 and its corrigendum Cor 1:2007; this International Standard, prepared by subcommittee 5: Testing and rating of household refrigeration appliances of ISO technical committee 86, Refrigeration and air-conditioning, was transferred to the IEC subsequent to IEC SMB decision 127/11. ISO 15502:2005 and its corrigendum are superseded by IEC 62552:2007.

EN 153:2006, *Methods of measuring the energy consumption of electric mains operated household refrigerators, frozen food storage cabinets, food freezers and their combinations, together with associated characteristics*, was prepared by CEN/TC 44, Household refrigerating appliances and commercial refrigeration equipment.

Clauses, subclauses, notes, tables, figures and annexes which are additional to those in IEC 62552:2007 are prefixed "Z".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 62552:2007 + corrigendum 2008 was approved by CENELEC as a European Standard with the following common modifications.

COMMON MODIFICATIONS

2   Normative references

Delete *the reference to ISO 817.*

Delete *the reference to IEC 60335-2-24:2002*

3   Terms, definitions and symbols

Add *the following definitions after 3.1.7:*

3.1.Z1
wine storage appliance
refrigerating appliance having one or more and only compartments exclusively designed for storage of wine

Note 1 to entry: An appliance containing compartment(s) which does not fulfil all requirements as specified for wine storage compartments cannot be called wine storage appliance.

3.1.Z2
multi door or other appliances
refrigerating appliance having two or more compartments, each one specified according to one of specifications as to Table 2 and being not covered by definitions as to 3.1.1 till 3.1.Z1

3.1.Z3
thermoelectric refrigerating appliance
refrigerating appliance where the cooling uses the Peltier effect

3.1.Z4
Mobile refrigerating appliance
appliance that is primarily intended to be used at different locations, having a mass of less than 18 kg

Note 1 to entry: While being moved, the appliance does not necessarily need to be operating.

Add *the following definitions after 3.3.3:*

3.3.Z1
zero-star compartment
low-temperature compartment intended for the freezing and storage of ice and for short time storage of frozen food in which the temperature is not warmer than 0 °C

3.3.5.Z2
wine storage compartment
compartment exclusively designed either for short-term wine storage to bring wine to the ideal drinking temperature or for long-term storage of wine, with the following features:

– a storage temperature range, either pre-set or set manually according to the manufacturer's instructions, in the range from +5 °C to +20 °C, each compartment providing $t_{wma} \leq$ +12 °C;

Note 1 to entry: The range from +5 °C to +20 °C indicates the maximum allowed range, no target values. If there is more than one wine storage compartment in one appliance, the temperature setting range can also be subdivided covering only part of the temperature range by each wine storage compartment.

– measured storage temperature(s) within a variation over time of less than 0,5 K at each declared ambient temperature specified by the climate class for household refrigerating appliances (see 8.Z1);

– active or passive control of the compartment humidity within a range from 50 % to 80 % relative humidity;

– constructed to reduce the transmission of vibration to the compartment, whether from the refrigerator compressor or from any external source

3.3.5.Z3
pantry compartment
compartment intended for the storage of particular foods or beverages at a temperature warmer than that of the cellar compartment

3.3.5.Z4
multi-use-compartment
compartment intended for use at two or more of the temperatures of the compartment types in Table 2, capable of being set by the user to remain at the operating temperature range applicable to each compartment type

Note 1 to entry: Where temperatures can shift to a different operating range for a period of limited duration only, the compartment is not a "multi-use compartment".

3.3.5.Z5
low ambient switch
device activated at the low ambient temperatures, automatically or manually, to balance the temperatures in different compartment types used in combination if applicable

3.3.5.Z6
thermal accumulator
device with thermal capacity provided by manufacturer

Replace Definitions 3.5.3, 3.5.4, 3.5.5 and 3.5.6 by:

3.5.3
overall dimensions
space – height, width and depth – with doors or lids closed

3.5.4
overall space required in use
total space – height, width and depth – with doors or lids open

3.5.5
gross volume
volume within the inside liner of the refrigerating appliance or of a compartment with an external door, in every case without internal fittings and with doors or lids closed

3.5.6
storage volume
part of the gross volume of any compartment that remains after deduction of the volume of components and spaces unusable for the storage of food

Note 1 to entry:　　See 7.2.

*In Definition 3.5.7, **delete** the note.*

***Add** the following definitions after 3.6.23:*

3.6.Z1
wine compartment storage temperature
t_{wma}
mean temperature of the wine storage compartment

3.6.Z2
humidity wine compartment
RH_{wim}
internal relative humidity in a wine storage compartment as integrated time average

3.6.Z3
pantry compartment storage temperature
t_{pma}
mean temperature of the pantry storage compartment

***Add** the following definitions after 3.7.4:*

3.7.Z1
humidity control device
device which automatically regulates the humidity level inside a compartment

3.7.Z2
ambient air exchange device
device which allows to exchange the air in a refrigerating compartment with ambient air, either fix as to manufacturer design, or to be controlled automatically, or to be set manually by the user as to manufacturer's instructions

Note 1 to entry:　　The hole for defrosting water draining is not considered as an air exchange device.

3.8　Symbols

***Replace** the content by:*

T_i, T_{ci}, T_{wi}, T_{ai}	temperature measurement positions
t_i	instantaneous temperature value (fresh food compartment)
$t^{(*)}$, t^*, t^{**}, t^{***}	The temperatures of each compartment, cabinet or section is the maximum temperature of any M-package in that compartment, cabinet or section.
t_{amb1}, t_{amb2}	instantaneous ambient temperature value
$t_{amb1.m}$ / $t_{amb2.m}$	integrated time average of t_{amb1}/t_{amb2}
$t_{amb.ma}$	arithmetic average of $t_{amb1.m}$ and $t_{amb2.m}$
t_{ci}	instantaneous temperature value (cellar compartment)

t_{cc}	instantaneous temperature value (chill compartment)
t_{wi}	instantaneous temperature value (wine storage compartment)
t_{pi}	instantaneous temperature value (pantry compartment)
t_{im}	integrated time average of t_i
t_{cim}	integrated time average of t_{ci}
t_{wvim}	integrated time average of t_{wi}
t_{pvim}	integrated time average of t_{pi}
t_{va}	instantaneous arithmetic average of t_1, t_2, t_3
t_{ca}	instantaneous arithmetic average of t_{c1}, t_{c2}, t_{c3}
t_{ma}	arithmetic average of t_{1m}, t_{2m}, t_{3m}
t_{cma}	arithmetic average of t_{c1m}, t_{c2m}, t_{c3m}
t_{wma}	arithmetic average of t_{w1m}, t_{w2m}, t_{w3m}
t_{pma}	arithmetic average of t_{p1m}, t_{p2m}, t_{p3m}
RH_{wi}	instantaneous relative humidity (wine storage compartment)
RH_{wim}	integrated time average of RH_{wi}
E_{24h}	energy consumption of household refrigerating appliance in kWh/24 h (conditions as in Table 5)
i	subscript representing 1, 2 or 3

4 Classification

Add the following text after Table 1:

If the lowest declared temperature is not within standard climate classes, the lowest ambient temperature is the temperature where the appliance can be used fulfilling the storage test requirements. This temperature shall be indicated in the user manual and the test report.

5 Materials, design and manufacture

Add the following after 5.7.6:

5.7.Z1 Wine storage appliances and wine storage compartments shall be constructed by using suitable means to reduce transmission of vibration to the compartment(s), whether from the refrigerating system or from any external source.

6 Storage temperatures

Replace Table 2 by the following table:

Table 2 – Storage temperatures

°C									
Fresh-food storage compartment		**Food freezer and three-star compartment/ cabinet**	**Two-star compartment/ section**	**One-star compartment**	**Cellar compartment**	**Chill compartment**	**Wine compartment**	**Zero-star compartment**	**Pantry compartment**
t_{1m}, t_{2m}, t_{3m}	t_{ma}	t^{***}	t^{**}	t^{*}	t_{cm}	t_{cc}	t_{wma} [a, b]	$t^{(*)}$	t_{pma}
$0 \le t_{1m}, t_{2m}, t_{3m} \le 8$	$\le +4$	≤ -18 [a]	≤ -12 [a]	≤ -6	$+8 \le t_{cm} \le +14$	$-2 \le t_{cc} \le +3$	$+5 \le t_{wma} \le +20$ $t_{wma} \le +12$	$t^{(*)} \le 0$	$+14 < t_{pma} < +20$

[a] As a result of a defrost cycle, the storage temperatures of frost free and/or adaptive defrost refrigerating appliances are permitted to rise by no more than 3 K during a period not greater than 4 h or 20 % of the duration of the operating cycle, whichever is the shorter. An example of an operating cycle for a frost-free refrigerator-freezer is given in Figure 1. For wine storage compartments applies that the maximum temperature t_{wi} shall not be more than 1,5 K above integrated time average temperature t_{wim} for each measuring point.

[b] The range +5 °C to +20 °C indicates the maximum allowed range, no target values. If there are more than one wine storage compartment in one appliance the temperature setting range can also be subdivided covering only part of the temperature range by each wine storage compartment. Each compartment shall provide $t_{wma} \le +12$ °C.

7 Determination of linear dimensions, volumes and areas

7.1 Determination of linear dimensions

Change 1st sentence of 2nd paragraph to: The measurement shall be carried out on the refrigerating appliance in its final condition for use (i.e. all external fittings supplied with the appliance for installation by the user).

Add sentence to 3rd paragraph: If there is a difference between the delivery status and the final condition for use this information shall be made available to the user at the point of sale.

Figure 2: Change drawing to include space for air circulation mentioned in paragraph 4

Key
1 width with door open
2 depth with door open
3 space necessary for free circulation of air
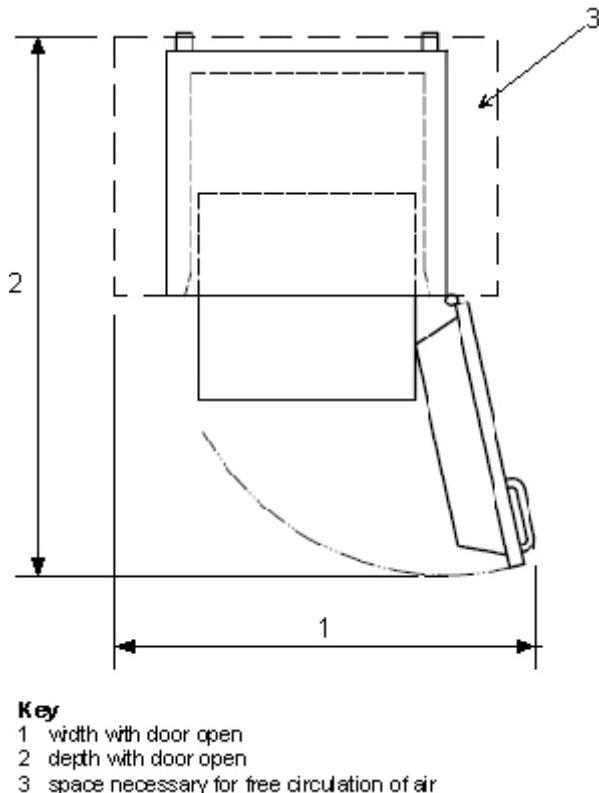
Replace title and text of 7.2.4 by:

7.2.4 Storage volume of fresh-food storage, chill, cellar, pantry and wine storage compartments

The storage volume of the fresh-food storage, chill, cellar, pantry and wine storage compartment shall be the gross volume of the compartment minus

– the volume of the evaporator space,

– the volume of any housings (such as those for interior lights, temperature-control devices and other devices e.g. non removable telescopic guides),

– the volume of shelves, partitions, retainers and other accessories whose wall thickness is greater than 13 mm according to 7.2.9.1,

– the space between the inner door protrusion and the inner liner of the fresh-food storage compartment, chill, cellar pantry and wine storage compartment, unless it is intended for the storage of food.

Where the volumes of the cellar compartment, pantry and wine storage compartment and fresh-food storage compartment are adjustable relative to one another by the user, the storage volumes of these

compartments shall be determined with the cellar compartment, pantry or/and wine storage compartment adjusted to its minimum and maximum volumes.

Add the following sentence at the end of 7.2.5.2:

Where the evaporator is covered by fix means, the depth of the evaporator space shall be taken as the mean horizontal distance to the foremost part of the protection cover.

Replace the text of 7.2.5.3 by:

The width of the evaporator space shall be the overall horizontal width of the evaporator itself or the protection or cover where applicable (neglecting suction headers near the top of the evaporator) or, if side ribs are used, the overall width including the ribs.

If there is less than 70 mm horizontal distance between the evaporator or the ribs or the protection or cover where applicable and an inside wall of the enclosed space of the cabinet, such space shall be considered as part of the evaporator space.

Replace the text of 7.2.5.4 by:

The height of the evaporator space shall be the mean vertical distance between the lower limit of the evaporator or the protection or cover where applicable and the upper partition of the food storage compartment.

If the free space between the upper surface or top of the evaporator or the protection or cover where applicable and the upper partition of the food storage compartment exceeds 40 mm, it shall be added to the storage volume of the fresh-food storage compartment.

The evaporator height shall include any internal drip tray and/or drip collector, except in the case when the storage height of the drip tray is greater than 40 mm and a definite manual operation is also needed to initiate defrosting.

Replace title and text of 7.3.2.7.2 by:

7.3.2.7.2 Fresh-food storage compartment, chill, cellar pantry and wine storage compartments

Any part of a full shelf, basket or the bottom of a compartment having less than 100 mm vertical clearance above, when all the shelves and baskets are in position, shall be excluded when calculating the storage area. However, it is admissible that for one full shelf or basket the vertical clearance may be reduced to not less than 80 mm (see Figure 19 b)).

For specific shelves as bottles shelves used in e.g. wine storage compartments, no vertical clearance requirement applies.

Replace title and text of 7.3.4.1 by:

7.3.4.1 Fresh-food storage compartment, chill, cellar and wine storage compartments

The area of the interior surface of the bottom of a suspended container and the area of the shelf immediately below shall not both be counted, unless the vertical clearance between this shelf and the exterior surface of the bottom of the container is at least 100 mm. For specific shelves as bottles shelves used in e.g. wine storage compartments, no vertical clearance requirement applies.

Nevertheless, in the case of one container – and one only – this minimum clearance may be reduced to 80 mm to the extent where this possibility has not been applied for the shelves.

If the minimum vertical clearance within a suspended container, as measured between the interior surface of the bottom and the cover, or to the shelf immediately above, is less than 40 mm, the bottom area of the container shall not be added.

Add the following new subclause after 7.3.4.2:

7.3.4.Z1 Evaluation of bottle capacity for wine storage compartments

For the evaluation of the rated capacity of bottles 0,75 l bottles or equivalent substitution with dimension as specified in Figure Z1 shall be used.

Bottles to be filled with water to provide a total weight of each bottle of 1 200 g ± 50 g to consider the deformation of shelves.

Removable parts which are stated by the manufacturer as necessary for the proper thermal and mechanical functioning of the wine storage compartment have to be placed in its intended position as to manufacturer's instructions.

Bottles will be stacked on each area intended to carry bottles in normal usage as to following rules:

– clearance to wall/back/door as to manufacturer's instructions;

– in the absence of instructions the rear end of shelves and 5 mm clearance to door are considered as limit, proper cooling function has to be ensured;

– bottles placed in door shelves may touch door liner;

– if evaporator is covered by fix means for protection bottles can stack till the protection, proper cooling function has to be ensured;

– bottles can be placed reverse and interleave;

– bottles can be in touch with side walls if nothing else stated by manufacturer;

– bottles can be placed horizontal or vertical, inclined if fixed means provide incline position;

– movable parts like telescopic shelves have to be kept movable and accessible under loading conditions.

A sketch of the bottle loading plan showing the location of bottles for evaluation of the bottle capacity for wine storage compartments shall be included in test report.

8 General test conditions

8.2 Ambient temperatures

Replace the text by:

Local ambient temperatures t_{amb1} and t_{amb2} are measured at two points T_{a1} and T_{a2}, located at the vertical and horizontal centreline of the sides of the refrigerating appliance and at a distance of 350 mm from the refrigerating appliance (see Figure 3).

The overall ambient temperature $t_{amb.ma}$ for a single appliance is the arithmetical average of the time-integrated temperatures $t_{amb1.m}$ and $t_{amb2.m}$. It is the value used for the tests.

Ambient temperatures are measured using copper or brass cylinders (see 8.7) at each of the two measurement points.

Ambient temperature sensors shall be shielded from any sources or sinks of radiant and or convective heat in the test room, including conditioning equipment, external windows, the appliance itself or other appliances under test.

During all tests the integrated time average temperatures $t_{amb1.m}$ and $t_{amb2.m}$ shall be within ± 0,5 K from the arithmetic average ambient temperature $t_{amb.ma}$.

The vertical ambient temperature gradient from the platform specified in 8.4 to a height of 2 m shall not exceed 1 K/m measured at the same vertical axis as for the ambient temperature measurement.

Tests shall be carried out under the following conditions of measured ambient temperature.

a)   For checking the storage temperatures:

  + 10 °C and + 32 °C   for class SN refrigerating appliances;

  + 16 °C and + 32 °C   for class N refrigerating appliances;

  + 16 °C and + 38 °C   for class ST refrigerating appliances;

  + 16 °C and + 43 °C   for class T refrigerating appliances.

   For a rated range of climate classes, tests shall be performed at the extreme ambient temperatures of the range of rated classes.

   EXAMPLE   For refrigerating appliances rated from SN to T, tests are performed at + 10 °C and at + 43 °C.

b)   For checking the energy consumption, temperature rise time, freezing capacity and ice-making capacity of all refrigerating appliances, as applicable:

  + 25 °C   for class SN, class N, class ST and class T refrigerating appliances.

c)   For all other tests: at the temperature stated in the test specifications.

8.3   Humidity

Replace the text by:

Unless otherwise specified, relative humidity shall not exceed 75 %.

For the test measuring of humidity in wine storage compartments, the relative ambient humidity shall be 50 % ≤ RH ≤ 75 % (see 8.Z2).

8.4   Installation of refrigerating appliances

Replace a) by:

a)   One of the partitions shall be placed parallel to the rear of the refrigerating appliance:

1)   for free-standing appliances, against the spacers defined as physically existing devices which fix the distance between the rear of the appliance and the wall behind the appliance. They can either be permanently attached to the appliance or provided as separate parts, which have to be installed by the user. If no spacers are provided then the manufacturer specification for the rear clearance shall be observed:

— The rear clearance is defined as the distance between the rear side of the appliance (rearmost projection) and the vertical partition. The rear side of the appliance is defined as the back wall of the foam housing itself, so excluding any condenser or other protruding elements.

— Where the rear clearance is specified, the appliance shall be positioned such that this clearance is respected with a maximum of 50 mm.

— Where the rear clearance is not specified, the appliance is to be positioned with its rearmost projection in contact with the vertical surface behind it.

— For free-standing absorber appliances the manufacturer specification for the rear clearance shall be observed (without spacer maximum 20 mm between rearmost projection and wall).

2) for built-in appliances, at the distance specified by the manufacturer in connection with the required overall space.

3) for mobile appliances, at the distance specified by the manufacturer

The consumer shall be informed about the influence of this condition on the measure of the energy consumption of the appliance.

Add the following note after a):

NOTE   Stops are physically existing devices which fix the distance between the rear of the appliance and the wall behind the appliance. They can either be permanently attached to the appliance or provided as separate parts, which are installed by the user.

8.5   Test packages

In 8.5.2, replace the last sentence of b) by:

For the measurement of chill compartments and zero-star compartment, only test package b), with a freezing point of -5 °C, shall be used.

8.6   Operating requirements for refrigerating appliances

At the end of 8.6.3.1, add the following sentence:

Where the refrigerating appliance has a rated voltage within the range between 220 V and 240 V, it shall be tested at 230 V $\pm$ 1 % with a frequency of 50 Hz $\pm$ 1 %.

At the end of 8.6.4, add the following sentences:

If position of shelves is adjustable, those shall be spread equally in the cabinet.

For wine storage compartments shelves, baskets and container shall be in position as defined in 7.3.4.Z1.

Replace the text of 8.6.5 by:

Accessories that are not necessary for the normal operation of the refrigerating appliance shall remain non-operational during testing, as long as nothing specific is specified in any other paragraph.

Add the following new subclause after 8.6.5:

8.6.Z1   Through-the-door devices

If the refrigerating appliance is fitted with a through the door device this shall be closed. Every energy consuming additional device (e.g. display, lightening etc.) is to be switched on when starting the test. Operation like ice or water dispensing will not be performed.

8.7 Measuring instruments

*In 8.7.1, **replace** the 5th paragraph by:*

Temperature-measuring instruments shall have an overall accuracy of measurement of not greater than $\pm 0,3$ K. This accuracy shall be maintained throughout the temperature measuring circuit. Regular calibration of temperature equipment is required at the temperature range of interest.

***Replace** the text of 8.7.2 by:*

The relative humidity shall be measured and recorded at a point which is representative. The accuracy of the measuring instruments shall be such that the result, expressed as the dew point, shall have an overall accuracy of measurement of not greater than $\pm 0,3$ K.

***Replace** the text of 8.7.3 by:*

Watt-hour meters shall be readable to 0,001 kW h and be accurate to within ± 1 % of the total energy consumption measured during the test period (i.e. 1 % of reading). Calibration of Watt-hour meters shall be performed at the range used in the measurements.

The measuring accuracy shall be stated in the test report.

8.8 Measurement of storage temperature

***Replace** the title and text of 8.8.1 by:*

8.8.1 Fresh-food storage compartment, cellar compartment and pantry compartment

The temperatures t_{1m}, t_{2m} and t_{3m} (see 3.6.2 and 3.8), t_{c1m}, t_{c2m}, t_{c3m} (see 3.6.4 and 3.8) and t_{p1m}, t_{p2m}, t_{p3m} (see 3.6.Z3 and 3.8) shall be measured using copper or brass cylinders, except for the freezing test of refrigerator-freezers, when they shall be measured in M-packages suspended and located at the temperature-sensing points.

For determining the storage temperature, the temperature-sensing points shall be located at T_1, T_2, T_3, T_{c1}, T_{c2}, T_{c3}, and T_{p1}, T_{p2}, T_{p3} as shown in Figures 14 and 15, halfway between the rear internal wall of the appliance and the internal wall of the closed door.

The temperatures t_{1m}, t_{2m} and t_{3m}, and t_{c1m}, t_{c2m} and t_{c3m} and t_{p1m}, t_{p2m} and t_{p3m} at the temperature-sensing points shall be the integrated time averages of t_1, t_2 and t_3, and t_{c1}, t_{c2} and t_{c3}, and t_{p1}, t_{p2} and t_{p3} respectively, during an test period with an integral step of 60 s or less.

The storage temperatures t_{ma} (see 3.6.2), t_{cma} (see 3.6.4) and t_{pma} (see 3.6.Z3) are the arithmetical average of the mean temperatures t_{1m}, t_{2m} and t_{3m} and t_{c1m}, t_{c2m} and t_{c3m} and t_{p1m}, t_{p2m} and t_{p3m} respectively.

If internal components do not allow the temperatures t_1, t_2 and t_3, t_{c1}, t_{c2} and t_{c3}, and t_{p1m}, t_{p2m} and t_{p3m} to be read at the points specified, readings may be taken in positions such that the geometrical centre of the cylinder or the M-package is no more than 25 mm from the point specified. If the interior arrangement of the fresh-food storage and cellar compartments does not conform to those shown in Figures 14 and 15, the temperatures t_1, t_2 and t_3, and t_{c1}, t_{c2} and t_{c3}, shall be read in positions determined by analogy with the positions indicated.

For the freezing test for refrigerator-freezer, the M-packages shall be supported or suspended in order to have their geometrical centre at the temperature-sensing points and so that their largest surface is horizontal. The instantaneous temperatures of the M-packages t_1, t_2 and t_3, t_{c1}, t_{c2} and t_{c3} ,and t_{p1}, t_{p2} and t_{p3} shall be recorded.

The temperatures shall be recorded.

8.8.2 Chill compartment

Change 2nd paragraph to

The temperature t_{cc} (see 3.6.5) shall always be measured in M-packages positioned or suspended so that their largest surface is horizontal. They may be positioned directly on the floor of the compartment but shall always be at least 25 mm away from all walls and ceilings and from the other packages of the test load.

Add the following new subclause after 8.8.3:

8.8.Z1 Wine storage compartment

The temperatures t_{w1m}, t_{w2m}, t_{w3m} shall be measured in M-packages supported or suspended in order to have their geometrical centre at the temperature-sensing points and so that their largest surface is horizontal. The M-packages may be supported, for example, by use of a block of expanded polystyrene (EPS) of the same base dimensions as the M package. M-packages shall have no direct contact to any other surface.

For determining the storage temperature, the temperature-sensing points shall be located at T_{w1}, T_{w2}, T_{w3} as shown in Figure Z2, halfway between the rear internal wall of the appliance and the internal wall of the closed door. Walls defined as being considered for the calculation of storage volume.

The M-packages shall be separated from any heat-conducting surface by at least 25 mm of air space. The instantaneous temperatures of the M-packages t_{w1}, t_{w2} and t_{w3} shall be recorded.

The temperatures t_{w1m}, t_{w2m} and t_{w3m} at the temperature-sensing points shall be the integrated time averages of t_{w1}, t_{w2} and t_{w3} during a test period with an integral step of 60 s or less.

The storage temperature t_{wma} is the arithmetical average of the mean temperatures t_{w1m}, t_{w2m} and t_{w3m}.

If internal components do not allow the temperatures t_{w1}, t_{w2} and t_{w3} to be read at the points specified, readings may be taken in positions such that the geometrical centre of the M-package is no more than 25 mm from the point specified. If the interior arrangement of the wine storage compartment does not conform to those shown in Figure Z2, the temperatures t_{w1}, t_{w2} and t_{w3} shall be read in positions determined by analogy with the positions indicated.

If there is an ambient air exchange device and this can be influenced by the user the device shall be set in condition as for usual usage providing its functionality as to manufacturer's instructions.

Storage temperatures have to be tested at an ambient of 25 °C and the lowest and uppermost ambient temperatures as to declared climate classes.

Each wine storage compartment shall be measured at $t_{wma} \leq 12$ °C.

The temperatures shall be recorded.

8.9 Determining stable operating conditions

Change 1st sentence in 1st paragraph to

Stable operating conditions are considered to exist when (…) storage temperatures and energy consumption values during two successive periods of at least 24h – (…)

8.10 Test period

Add the following sentence after the 1st paragraph:

The second period used for the verification of stable operating conditions can be part of the actual test period.

Add the following new subclauses after 8.11:

8.Z1 Determining temperature fluctuation in wine storage compartments

Determining of the temperature fluctuation will be performed at the temperature t_{wma} = 12 °C or the nearest colder temperature at ambient temperature of 25 °C and lowest and uppermost ambient temperature as declared in the climate class.

The test will be performed in condition as specified in 8.8.Z1.

Time fluctuation is evaluated for each measuring point T_{wi}. The instantaneous temperatures of the M-packages t_{w1}, t_{w2} and t_{w3} shall be recorded.

An amplitude is specified as the difference between the warmest and coldest instantaneous temperature between two successive stops of the refrigerating system. If no successive stops of the refrigerating system can be identified sequent periods of 4 h will be considered.

The average of all temperature amplitudes at each measurement point T_{wi} during the whole test period shall stay within 0,5 K.

8.Z2 Determining relative humidity inside of wine storage compartments

Determining of the relative humidity RH_{wim} in wine storage compartment will be performed at the temperature t_{wma} = 12 °C or the nearest colder temperature at ambient temperature of 25 °C and an ambient humidity 50 % ≤ RH ≤ 75 %.

The test will be performed in condition as specified in 8.8.Z1.

A specific device to control or influence the internal relative humidity shall be set in operation as to manufacturer's instructions.

The humidity sensor shall be placed in the position according to Figure Z2. The instantaneous value of the relative humidity RH_{wi} shall be recorded.

The integrated time average of the relative humidity RH_{wim} shall be expressed as percentage rounded to the nearest integer.

8.Z3 Circumvention

It is forbidden that the appliance recognises automatically a test condition and reacts to it to achieve a better test result e.g. during an energy test.

10 *Void*

11 Testing the durability of doors, lids and drawers

*In the first hyphenated paragraph of 11.2.3, **replace** "$T \geq$ -6 °C" by "$T >$ -6 °C".*

*In the first hyphenated paragraph of 11.3.3, **replace** "$T \geq$ -6 °C" by "$T >$ -6 °C".*

12   Testing mechanical strength of shelves and similar components

Replace the title of 12.2.2 by:

12.2.2   Fresh-food storage, chill, cellar compartments pantry and wine storage compartments

13   Testing storage temperatures

*In 13.2, **replace** the first sentence of the second paragraph by:*

The refrigerating appliance shall be set up in accordance with the manufacturer's instructions which are not in conflict with this standard.

***Add** at the end of 13.2:*

Wine storage compartment shall be operated in accordance with 8.8.Z1.

*Between 13.3.2 and 13.3.2.1, **add** the following note:*

NOTE   Numbering indicates priority.

***Add** the following sentence to 1st paragraph:*

… except for compartments with a height of less than 60 mm which have been claimed as storage volume. In this case the vertical clearance between the upper edge of the highest test package and the horizontal surface situated immediately above may be lass than 10 mm (but the package shall not touch the ceiling).

***Add** the following at the end of 13.3.2.8:*

Accumulators are to be installed according to manufacturer's instructions (e.g. loading plan) which shall be in line with this standard. If accumulators are to be used for a test inside the boundaries of the declared storage volume, the volume of the accumulators shall be deducted from the storage volume (see rule 7.2.7.f).

***Replace** 13.4 by*

13.4   Refrigerating appliances with adjustable compartments

13.4.Z1   Refrigerating appliances with adjustable cellar compartment

If the refrigerating appliance includes a cellar compartment and the volumes of this compartment and of the fresh-food storage compartment can be changed in relation to one another by the user, the cellar compartment shall be adjusted to its minimum volume for the test in high ambient temperature and to its maximum volume for the test in low ambient temperature (see 8.2).

13.4.Z2   Refrigeration appliances with adjustable wine storage compartment

If the refrigerating appliance includes a wine storage compartment and the volumes of this compartment and of the fresh-food storage compartment can be changed in relation to one another by the user, the wine storage compartment shall be adjusted to its minimum volume for the test in high ambient temperature and to its maximum volume for the test in low ambient temperature.

13.4.Z3   Wine storage appliances with adjustable sub compartments

If the wine storage appliance includes more than one wine storage compartment and the volume of this compartments can be changed in relation to one another by the user, a compartment which can be set only colder than 12 °C shall be adjusted to its maximum volume. If all compartments are to be set on 12 °C, it shall be adjusted to most equalized position.

*In 13.6, **add** the following after h):*

za)   the values of the wine storage compartments t_{wma} and the values of t_{w1m}, t_{w2m}, t_{w3m} and the values of the maximum and minimum recorded for t_{w1}, t_{w2}, t_{w3}.

15   Energy consumption test

*In 15.1, **delete** the note and **add** the following second sentence:*

The energy consumption test in case of multi-use compartments is performed at the target temperature of the coldest compartment type declared by the manufacturer (Table 5).

*In 15.2.1, **replace** the text by the following:*

The ambient temperature shall be in accordance with 8.2.

When the measured ambient temperature deviates from the nominal (+ 25 °C) ambient temperatures up to $\pm$ 0,5 K, the following first order correction on the measured energy consumption shall be made:

$$P^{corr} = P^{meas}\left[\sum_{i=1}^{n} \frac{(25 - t_i)}{(t_{aa} - t_i)} \frac{V_i}{V}\right]$$

where

P is the energy consumption [kW/24 h];

t_i is the nominal compartment temperature, e.g. 5 °C (see Table 5);

V_i is the net volume compartment *i* [dm^3];

V is the total net volume [dm^3];

t_{aa} is the measured ambient temperature.

*In 15.2.2, **add** the following after the last paragraph:*

If the wine storage appliance includes more than one wine storage compartment and the volumes of those compartments can be changed in relation to one another by the user, the compartments shall be adjusted to most unfavourable condition. If a wine storage compartment is adjustable in relation to another colder compartment type as specified in Table 2 and Table 5, the wine storage compartment shall be adjusted to its minimum.

Add the following new subclauses after 15.2.2:

15.2.Z1   Through-the-door devices

See 8.6.Z1.

15.2.Z2   Compartment with air exchange devices

If there are devices to allow air exchange between the compartment and the ambient (e.g. for wine storage compartments) and those can be influenced by the user the device shall be set in condition as for intended usage providing its functionality as to manufacturer's instructions.

Replace the text of the first paragraph of 15.3.1.2 by:

When all the target temperature(s) in accordance with Table 5 are met simultaneously, the value measured during the test period of 8.10 giving the lowest energy consumption is the recorded value.

Replace the last sentence of 15.3.1.3 by:

The deviation from the target temperature shall not exceed ± 2 K.

Add the following new subclause after 15.3.1.3:

15.3.1.Z1   For wine storage appliances, consisting of one or more wine storage compartments, the energy consumption shall be measured in the following way:

E_{24h} shall be measured at target temperature t_{wma} = 12 °C or by interpolation from the results of two test.

If warmest setting of a wine storage compartment is colder than 12 °C it shall be measured at its warmest setting.

Replace the text of 15.3.2 by:

The energy consumption is that which would be obtained when all of the following target temperature conditions are met:

a) t_{ma} = +5 °C with 0 °C ≤ t_{1m}, t_{2m}, t_{3m} ≤ +10 °C;

b) t_{cma} = +12 °C with +8 °C ≤ t_{c1m}, t_{c2m}, t_{c3m} (as appropriate) ≤ +14 °C, where a cellar compartment is provided;

c) t_{cc} ≤ +3 °C;

d)   the maximum temperature (t^{***}) of the warmest M-package in the food freezer compartment and any three-star frozen-food storage compartment equals -18 °C;

e)   the maximum temperature (t^{**}) of the warmest M-package in a two-star section within the food freezer compartment and with any three-star frozen-food storage compartment equals -12 °C;

f)   the maximum temperature (t^{*}) or ($t^{(*)}$) of the warmest M-package in any one-star compartment or any zero-star compartment equals to -6 °C or 0 °C respectively;

g) t_{wma} = +12 °C, or if the maximum setting in a wine storage compartment is colder than +12°C its maximum setting;

h) t_{pma} ≤ 17 °C.

Because these various temperature conditions cannot be attained simultaneously in general, the energy consumption shall be that corresponding to those of the above conditions which can be obtained

simultaneously and which give the lowest energy consumption, their number depending on the number of possibilities of adjustment; the other values complying with the basic temperature requirement as a maximum temperature limit.

Replace the text of 15.3.3.2 by:

The energy consumption shall be determined either at one of the target temperatures or by interpolation from the results of two tests: one giving a temperature warmer than, and the other a temperature colder than, the target temperature of t^{***} = -18 °C for condition a, t^{**} = -12 °C for condition b, t_{ma} = + 5 °C for condition c, or t_{cma} = +12 °C for condition d, or t_{wma} = +12 °C according to Table 5.

The difference between the two temperatures used for the interpolating test shall not exceed 2 K from the target temperature.

In the case of two tests, the results shall be interpolated to meet the requirements of one of the conditions a to d1 according to Table 5 (for examples, see Figure 10).

*In 15.3.4.1, **replace** Table 5 by:*

Table 5 – Energy-storage temperature conditions for determining energy consumption

Storage temperature for energy test	°C												
	Refrigerators and Type I refrigerators-freezers					Type II refrigerators-freezers, with food freezer compartment temperature-control device						Frozen-food storage cabinets and food freezers	
	a	b	c	d	d1	e	f	g	h	i	j		
t^{***} [a g]	-18 [b]	≤ -18	≤ -18	≤ -18	≤ -18	-18 [c]	≤ -18	-18 [c]	≤ -18	-18 [c]	≤ -18	-18	≤ -18
t^{**} [d g]	≤ -12	-12 [b]	≤ -12	≤ -12	≤ -12	≤ -12	-12 [c]	≤ -12	-12 [c]	≤ -12	-12 [c]	≤ -12	-12
t_{ma} [e f]	≤ + 5	≤ +5	+5 [b]	≤ +5	≤ +5	+5 [c]		≤ +5		≤ + 5		-	-
t_{cma} [f]	≤ +12	≤ +12	≤ +12	+12 [b]	≤ +12	≤ +12		+12 [c]		≤ +12		-	-
t_{cc}	≤ +3	≤ +3	≤ +3	≤ +3	≤ +3	≤ +3		≤ +3		≤ +3		-	-
t_{wma} [za zb]	≤ +12	≤ +12	≤ +12	≤ +12	+12 [b]	≤ +12		≤ +12		+12 [c]		-	-

If there are any two-star sections or one-star, or zero-star compartments, or pantry compartment the temperature conditions for these sections or compartments shall be ≤ -12 °C or ≤ -6 °C, < 0 °C, <17°C as appropriate.

If there are any chill compartments, the maximum value of t_{cc} shall be as close as possible to, but shall not exceed, +3 °C.

a   Maximum temperature of warmest M-package in the food freezer compartment and in any three-star frozen-food storage compartment.

b   In general, these temperatures are obtained by interpolation in accordance with 15.3.3.

c   In general, these temperatures are obtained by interpolation in accordance with 15.3.4.

d   Maximum temperature of the warmest M-package in any two-star section or compartment

e   With 0 °C ≤ t_{1m}, t_{2m}, t_{3m} ≤ +10 °C

f   For t_{ma} and t_{cma}, the conditions are either

   t_{ma} = +5 °C with + 8 °C ≤ t_{cma} ≤ +12 °C (but as close as possible to +12 °C if adjustment is possible — for example by flaps), or

   t_{cma} = +12 °C with t_{ma} ≤ +5 °C (but as close as possible to +5 °C if adjustment is possible — for example, by flaps).

g   As a result of a defrost cycle, the permitted temperature rise for food freezer and three-star cabinet/compartment and section and for two-star compartment in accordance with Table 2, applies.

za   As a result of a defrost cycle, the permitted temperature rise for wine compartment in accordance with Table 2, applies.

zb   If the warmest setting in a wine storage compartment is colder than t_{wma} = +12 °C its warmest setting shall be used.

   If there is more than one wine storage compartment in one appliance or compartment divider are used to provide sub-compartments with individual control each sub-compartment shall provide t_{wma} ≤ +12 °C.

Replace the last two lines of the first paragraph of 15.3.4.2 by:

temperature t_m = +5 °C or t_{cm} = +12 °C or t_{wma} = +12 °C (see Table 5, conditions e to j). The particular condition chosen shall be that which gives the lower energy consumption.

Replace the text of 15.3.4.3 by:

The energy consumption shall be determined at the target temperature for the fresh-food storage compartment, cellar compartment, wine storage compartment, food freezer compartment or frozen-food storage compartment, or by overall interpolation between the results of two tests.

When interpolation is used, the temperature obtained from one of the two tests shall be warmer than the target temperature for the chosen compartment, and the temperature obtained from the other of the two tests shall be colder than the target temperature for that compartment (see Figure 10). The difference between the two temperatures used for the interpolating test shall not exceed 4 K.

Replace the first paragraph of 15.4 by:

The values of the energy consumption shall be calculated for a period of exactly 24 h from the measured values.

17   Freezing test

Delete in the title of 17.2.1

(see Annex A)

Replace the title of 17.2.3.1 by:

17.2.3.1   Chill, cellar, wine storage and fresh-food storage compartments

Add the following after the second paragraph of 17.2.3.1:

The wine storage compartment shall be loaded with M-packages as for the storage temperature measurement test of Clause 13.

*At the end of the second paragraph in 17.2.4.1, **replace** "Table 2" by "Table 5".*

Replace the second and third paragraphs of 17.2.4.3 by:

In all appliances the light load shall be introduced in the shortest possible time.

The light load corresponds to the value stated by the manufacturer as that which can be frozen in 24 h and is made up of test packages which have previously been brought to a temperature of +25 °C ± 1 K for all climate classes.

*In 17.2.4.4.1, **replace** a), b), c) and d) by:*

a) the maximum temperature of any of the M-packages of the ballast load remains equal to or colder than -15 °C and that at the end of the test the maximum temperature of the warmest M-package of the ballast load is ≤ -18 °C;

b) the maximum temperature of the warmest M-package in any separate compartment not used for ballast in accordance with 17.2.3.3 remains ≤ -18 °C;

c) the maximum temperature of the warmest M-package in any two-star section remains ≤ -12 °C, excepting in the case of frozen-food storage and/or food freezer cabinets, where this temperature shall be < -9 °C during the test and ≤ -12 °C at the end of the test;

d) the maximum temperature of the warmest M-package in any two-star or one-star compartment remains ≤ -12 °C or ≤ - 6 °C, respectively.

In 17.2.4.4.1, **add** *the following after f):*

za) the average of all temperature amplitudes at each measurement point T_{wi} during the freezing test period shall stay within 1,5 K.

In 17.3, **add** *the following after j):*

za) the highest and lowest values of t_{w1}, t_{w2}, t_{w3}, and t_{w1m}, t_{w2m}, t_{w3m} , if applicable.

18   Ice-making test

Replace *the text of 18.2.1 by:*

The ambient temperature shall be in accordance with 8.2.

The supply water temperature shall be

  + 25 °C ± 1 K   for class SN, N ST and T refrigerating appliances.

If the refrigerating appliance is connected to a water supply, the temperature shall be measured at the point of connection to the appliance.

Replace *the second paragraph of 18.2.2 by:*

Ice trays shall be removed and the fresh-food storage compartment, chill compartment, cellar compartment pantry and wine storage compartment, if any, shall be equipped according to 8.8.

Replace *the fourth paragraph of 18.2.2 by:*

The temperature-control device shall be set in accordance with the manufacturer's instructions. When no instructions are given, the temperature-control device setting or the setting of other control devices should be approximately the same as for energy consumption test (see Clause 15). In such case, if target temperatures as the definition in 15.3.1.1 cannot be met simultaneously, the nearest possible colder control setting shall be used.

Replace *the last paragraph of 18.2.3.1 by:*

Throughout the ice-making test, none of the instantaneous temperatures t_1, t_2, t_3, t_{c1}, t_{c2} or t_{c3} shall fall below 0 °C; in addition, t_{cc} shall remain in accordance with Table 2. The average of all temperature amplitudes at each measurement point T_{wi} during the ice-making test period shall stay within 1,5 K.

19 Final test report

Replace the text of Clause 19 by:

The final test report shall include reference to this European Standard and shall comprise the following measurements and test results:

a) the overall dimensions;

b) the overall space required in use;

c) the total gross volume(s) (see Clause 7);

d) the storage volume(s) (see Clause 7);

e) the total storage volume (see Clause 7);

f) the storage shelf area (see Clause 7);

g) the defrosting type for each compartment, excepting that of frost-free refrigerating appliances;

h) air-tightness of door(s) or lid(s) (see Clause 9);

i) opening force test of doors or lids (see Clause 10);

j) durability test (see Clause 11);

k) mechanical strength test (see Clause 12)

l) storage temperature test (see Clause 13);

m) water vapour condensation test (see Clause 14);

n) energy consumption test (see Clause 15) (for wine storage appliances E_{24h});

o) temperature rise test, (see Clause 16);

p) freezing test, (see Clause 17);

q) ice-making test, (see Clause 18);

za) temperature fluctuation in wine storage compartment (see 8.Z1);

zb) relative humidity in wine storage compartment (see 8.Z2);

zc) bottle capacity for wine storage compartment (see 7.3.4.Z1);

zd) a sketch of the bottle loading plan showing the location of bottles for evaluation of the bottle capacity for wine storage compartments.

The final test report shall comply with the layout given in Annex ZB.

20 Designation

Replace the text of Clause 20 by "Void".

21 Marking

Replace the text of 21.1 by the following:

At least the following information shall be marked in a durable and legible manner on the appliance:

— the trademark or name of the manufacturer or responsible vendor;

— the model reference;

— compartment types (frost-free declaration if appropriate);

— the storage volume of each compartment;

— the bottle capacity for wine storage compartments;

— freezing capacity in kg/24 h if appropriate;

— temperature rise time in h if appropriate;

— the climate class or classes (SN, N. St, T).

Add the following after the second paragraph of 21.3:

Zero-star compartment shall not carry any star symbol.

22 Technical and commercial product information

Replace the text of Clause 22 by "Void".

23 Instructions for users

Add the following after q) at the end of Clause 23:

za) for wine storage appliances, the following information should be given: 'This appliance is intended to be used exclusively for the storage of wine'.

zb) za does not apply to household refrigerating appliances that are not specifically designed for wine storage but may nevertheless be used for this purpose or household refrigerating appliances that have a wine storage compartment combined with any other compartment type the following information is to be given:

1) for compartments providing a temperature setting close or higher than the declared lowest climate class temperature, instructions shall be provided on warmest possible temperature setting at low ambient temperatures;

2) the function and the influence to the energy consumption through the use of the "low ambient switch" are to be explained;

3) the influence on foodstuff preservation and on energy consumption as a result of appliance feature(s) activated by the user and altering the temperature in one or more compartments towards the warmest end of the storage temperature range of the compartment type in order to save energy in real usage should be stated.

Figures

Replace Figure 24 by the following figure containing a modified drawing:

Dimensions in millimetres
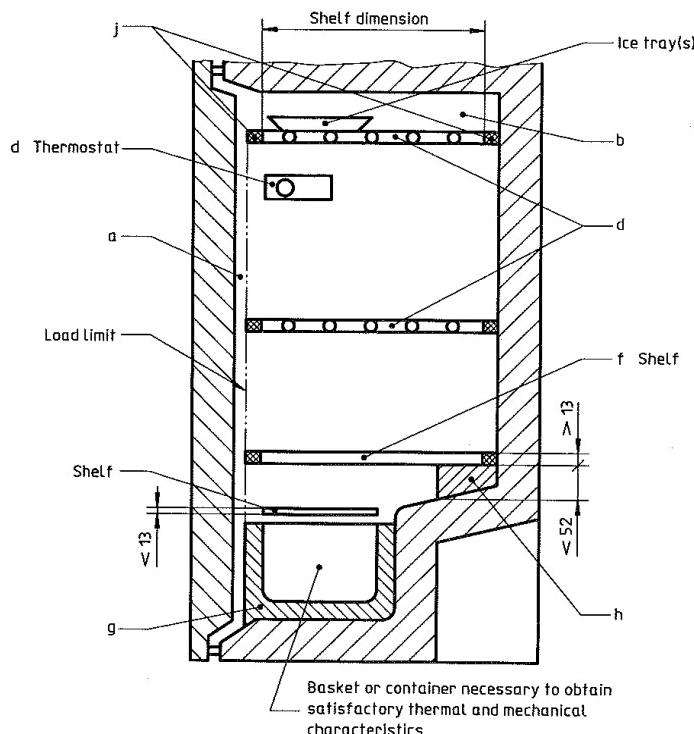
The volumes marked a, b, d, f, g, h and j shall be deducted from the gross volume. See 7.2.7.

Key

1   ice tray(s)
2   air duct
3   basket or container necessary for obtaining satisfactory thermal and mechanical characteristics
4   shelf
5   load limit
6   temperature-control device
7   shelf dimension

**Figure 24 – Example of determination of storage volume of frozen-food storage
or food freezer compartments/cabinets**

Replace Figure 25 by the following figure due to modifications in the formulas:
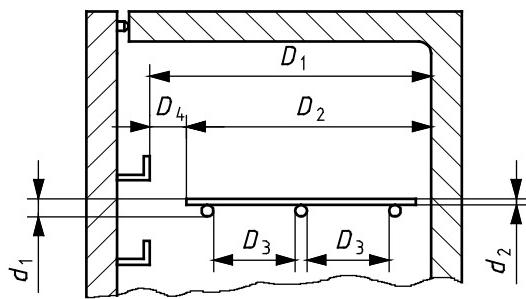
Side cross-sectional view
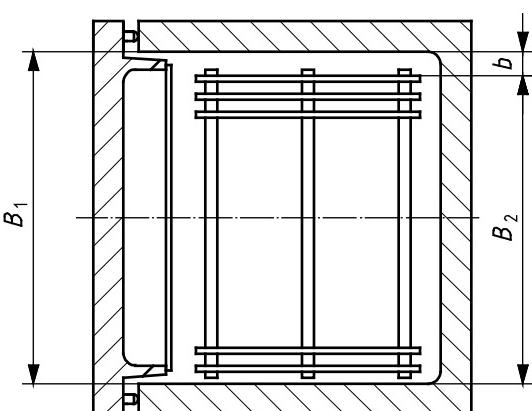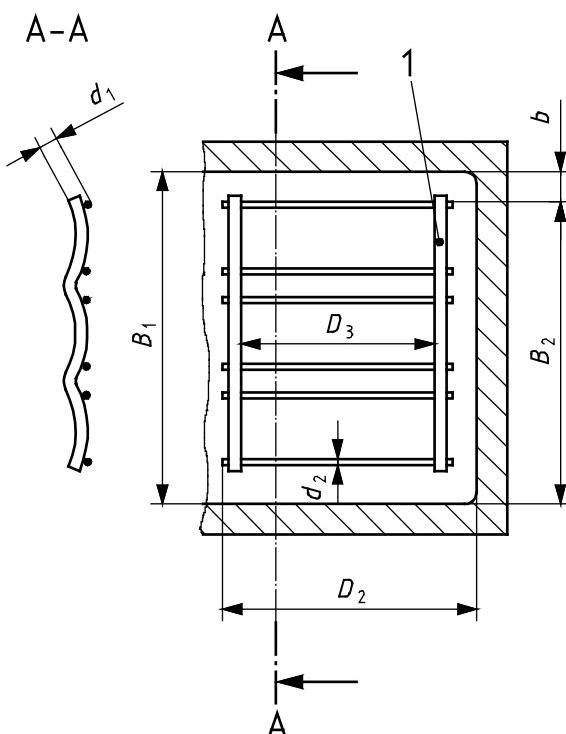
Top cross-sectional view

Top cross-sectional view

	Conditions	Volume to be deducted
1)	d_1 and $d_2 \le 13$ mm	0
2)	$d_1 > 13$ mm $d_2 \le 13$ mm $D_3 > 100$ mm	0
3)	$d_1 > 13$ mm $d_2 \le d_1$ $D_3 \le 100$ mm $D_4 \le 70$ mm $b \le 70$ mm	$d_1 \times D_1 \times B_1$
4)	$d_1 > 13$ mm $d_2 \le d_1$ $D_3 \le 100$ mm $D_4 > 70$ mm $b \le 70$ mm	$d_1 \times D_2 \times B_1$
5)	$d_2 > 13$ mm $D_3 > 100$ mm $D_4 \le 70$ mm $b \le 70$ mm	$d_2 \times D_1 \times B_1$
6)	$d_2 > 13$ mm $D_3 > 100$ mm $D_4 > 70$ mm $b \le 70$ mm	$d_2 \times D_2 \times B_1$
7)	if $b > 70$ mm, take B_2 instead of B_1 fractional shelf	

Key

1 bottle shelf

Figure 25 – Determination of volumes of shelves and partitions

Add the following figures after Figure 25:
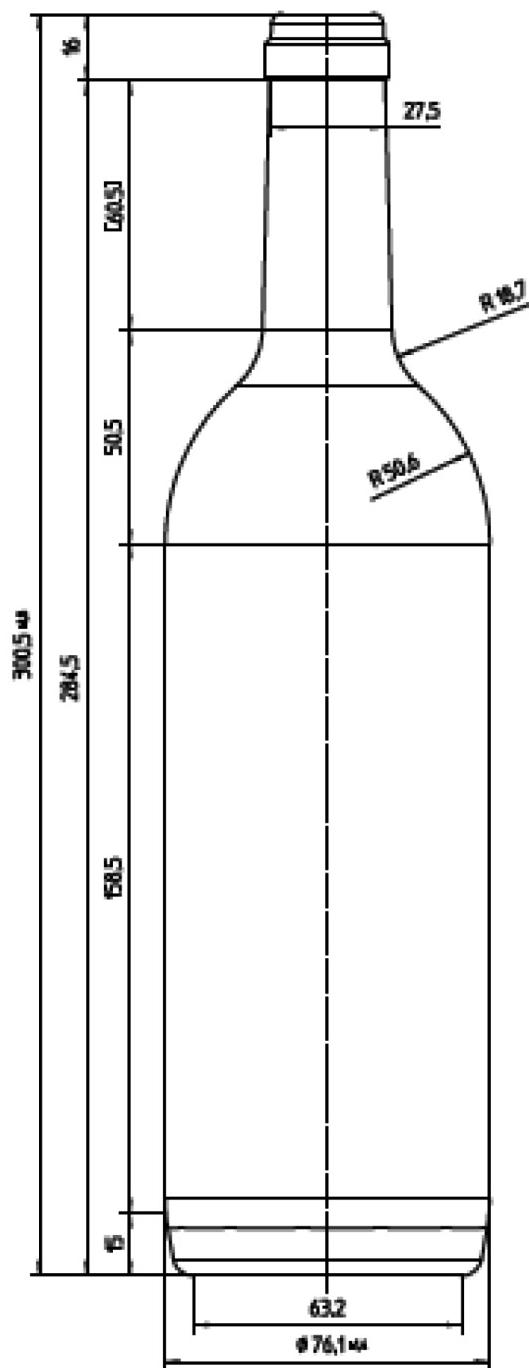
NOTE   The dimensions for the bottle derive from the French standard NF H35-124:2006-07-22, but no reference is made due to national standard.

Figure Z1 – Dimensions of bottle

Dimensions in millimeters

Figure Z2 – Temperature measurement points T_{wi}
in wine storage compartments relative to height h_w
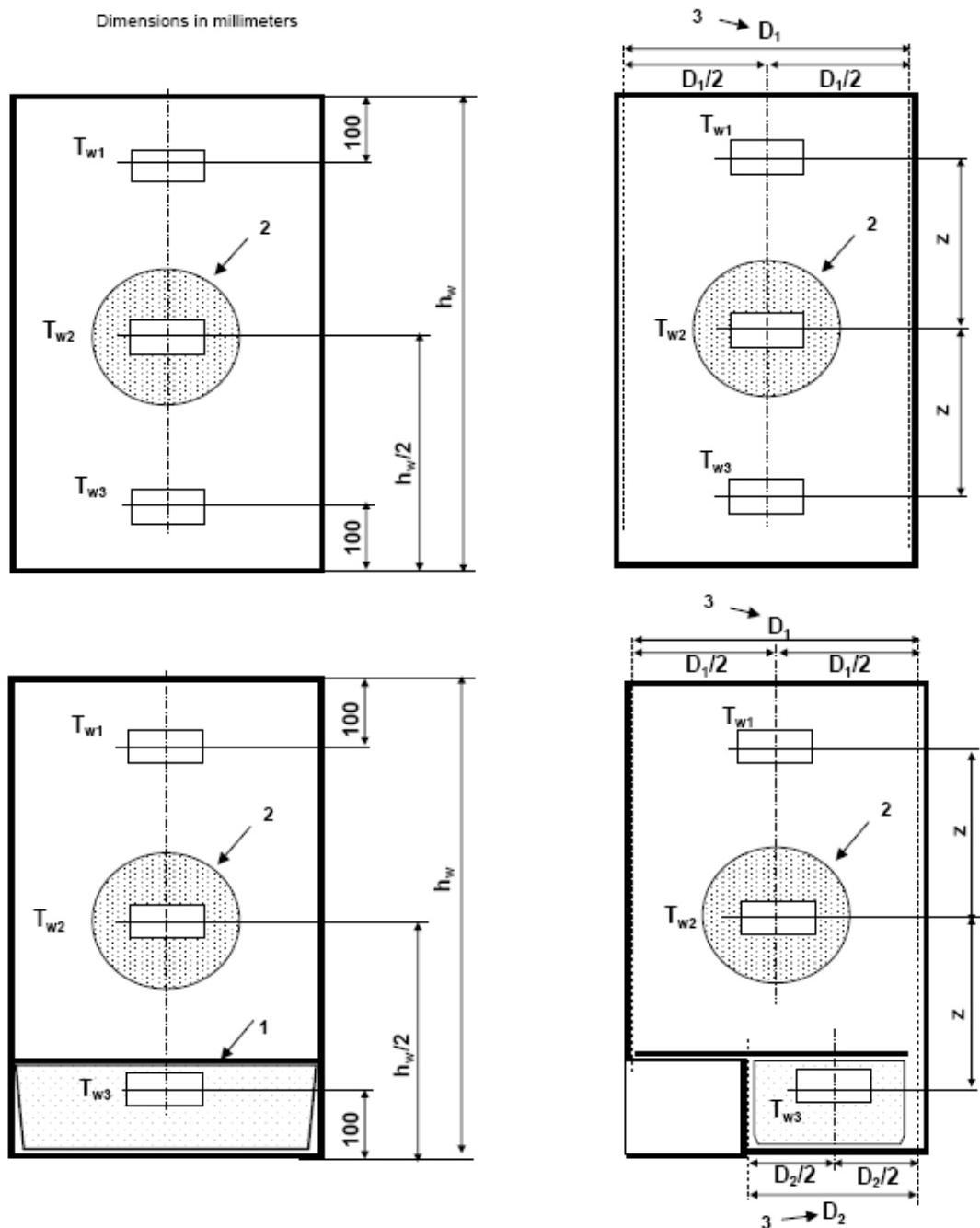
NOTE   For wine storage appliance closed with one door but split by fix or adjustable divider in separate compartments with independent temperature control, the arrangement applies for each compartment.

If z < 100 mm, T_{w2} shall not be used. If h_w < 300 mm, only T_{w2} shall be used.

Key

1   shelf above a container placed at lowest possible position

2   allowed area for positioning the humidity sensor – sphere with 100 mm radius around T_{w2}
     If T_{w2} is not present, it shall be placed analogous at $h_w/2$

3   D_1 resp D_2 = distance between reference lines as used for net volume determination

Annexes

Annex A (informative) **Conditions particular to certain countries**

Delete Clause A.3 "Japan".

Annex C (informative) **Test for absence of taste and odour**

Delete Clause C.4 "Test report".

Annex E (informative) **Rated characteristics and control procedure**

Replace *"(informative)"* by *"(normative*)"* in the title.

Add the following subclause after E.1.2:

E.1.Z1   Rated bottle capacity

The measured value according to 7.3.4.Z1 shall not be less than the rated value.

Replace the first two paragraphs of E.2.2 by:

The value measured in accordance with Clause 17 on the first refrigerating appliance tested shall be not less than the rated value by more than 10 %.

If the result of the test carried out on the first refrigerating appliance is less than the rated value minus 10 %, the test shall be carried out on a further three, randomly selected, refrigerating appliances.

Replace the first paragraph of E.2.3 by:

The value measured shall not be greater than the rated value by more than 10 %.

Replace the text of E.2.4 by:

The measured value shall not be less than the rated value by more than 10 %.

If the value obtained from the first test is less than the rated value minus 10 %, the test shall be carried out on a further three, randomly selected, refrigerating appliances. The arithmetical mean of the values of these three refrigerating appliances shall be greater than or equal to the rated value minus 10 % .

Add the following new annexes:

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
ISO 534	-	Paper and board - Determination of thickness, density and specific volume	EN ISO 534	-

Annex ZB
(normative)

Final test report layout

Test report – Household refrigeration appliance (Requirements from EN 62552 and 2010/30/EU)	**Date:** mm / dd / yyyy	**Appliance type:**	SomeFreezer SF1234
	Testing Institute: Science Lab Ltd. Anywhere Outinavillage Country	**Manufacturer:**	Man-U-Fact Ltd. Somewhere Inthecity Country
		Tested by:	xyz

Supplier name:	Man-U-Fact Ltd.
Appliance model:	SomeFreezer SF1234
Category[1]:	7

Efficiency class[2]:	A+++	Eco-label award (1980/2000 EC):	n.a.
Built-in Appliance:	yes/no	Climate Class[3]:	SN-ST

Overall dimensions[4] [mm]:	1234	x	1234	x	1234
Overall space required in use[4] [mm]:	2345	x	2345	x	2345

ALL APPLIANCES:	Decl.	Tested	WINE COOLERS:	Decl.	Tested
Total gross volume [L]:	1234	1234	Bottle capacity [pcs]:	n.a.	1234
Total storage volume [L]:	2345	2345	Temp. fluctuation test passed:		yes/no
Storage shelf area [cm²]:	3456	3456	Humidity range test passed:		yes/no

Com-part-ments	Type	Frost Free	Star rating	Vol. [L]:	Target storage temp. [°C]	Storage test passed? High temp.	Storage test passed? Low temp.	Ope-ning forceTest passed?	Air-tight-ness test passed?	Dura-bility test passed?	Mech. Strength test passed?
1	(***)*-Freezer	No	4	123	≤ -18	yes	Yes	yes/no	yes/no	yes/no	yes/no
2	***-Freezer	Yes	3	123	≤ -18	yes	no	yes/no	yes/no	yes/no	yes/no
3	**-Freezer	Yes	2	123	≤ -12			yes/no	yes/no	yes/no	yes/no
4	*-Freezer	No	1	123	≤ -6			yes/no	yes/no	yes/no	yes/no
5	0-star	n.a.	n.a.	n.a.	-6 ≤ 0			yes/no	yes/no	yes/no	yes/no
6	Chill	n.a.	n.a.	n.a.	-2 ≤ 3			yes/no	yes/no	yes/no	yes/no
7	Fresh Food	n.a.	n.a.	n.a.	0 ≤ +4			yes/no	yes/no	yes/no	yes/no
8	Wine	n.a.	n.a.	n.a.	+5 ≤ 20			yes/no	yes/no	yes/no	yes/no
9	Cellar	n.a.	n.a.	n.a.	+8 ≤ +14			yes/no	yes/no	yes/no	yes/no
10	Pantry	n.a.	n.a.	n.a.	+14 ≤ +20			yes/no	yes/no	yes/no	yes/no

	Tested	Passed?
Energy consumption 24h [kWh]	12,345	yes/no
Energy consumption 365d [kWh]	123,456	yes/no
Energy efficiency index [%]	123	yes/no
Energy efficiency class	A+++	yes/no
Ice production in 24h [kg]	n.a.	yes/no
Circumvention measures found?		yes/no*

	Tested	Passed
Temperature rise time [h]	12	yes/no
Freezing capacity 24h [kg]	1	yes/no
Lowest ambient temp. [°C]	123	yes/no
Noise [dB(A)]	12,3	yes/no

Every field has to be filled, either with data or "n.a."

Annex ZZ
(informative)

Coverage of requirements of commission regulation (EC) No 643/2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household refrigerating appliances.

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant requirements as given in Commission Regulation (EC) No 643/2009 of 22 July 2009, implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household refrigerating appliances and Commission Delegated Regulation (EU) No 1060/2010 from 28 September 2010, supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to ecodesign requirements for refrigeration appliances especially:

- ensuring that the prospective harmonized standard provides, where appropriate, revised and/or new definitions, characteristics and necessary parameters included in Regulation 643/2009 and in the Draft Labeling Directive, in particular for appliances and compartments to be used exclusively for wine storage, or with internal temperature between +14 °C and +20 °C, as well as for compartments with internal temperature between 0 °C and -6 °C;
- ensuring that the prospective harmonized standard(s) provides procedures and methods to measure at least the linear dimensions, areas and volumes, energy consumption, storage temperatures, compartments start ratings, freezing capacity, temperature rise time of free-standing and built-in household refrigerating appliances included in Regulation 643/2009 and the Draft Labeling Directive;
- ensuring that, for the purpose of Regulation 643/2009 appliances equipped for operation on different power supplies, but that can be operated at a rated voltage within the range between 220 V and 240 V, are tested only at 230 V ±1 % with a frequency of 50 Hz ±1 %;
- ensuring that the prospective harmonized standard includes a procedure that avoids an appliance being programmed to recognize the test conditions and reacting specifically to them;
- ensuring that the prospective harmonized standard takes into account improved test conditions, test materials, new appliance types and the state of the art at European and international level and better reflects the user behavior;
- defining a template for a test report indicating the information to be declared by the manufacturers to fulfill at least the ecodesign requirements set out in Regulation 643/2009 and in the Draft Labeling Directive.

WARNING: Other requirements and other EC Directives or Commission Regulations may be applicable to the products falling within the scope of this standard.

Bibliography

Replace all references with:

EN 60335-2-24, *Household and similar electrical appliances — Safety — Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and ice makers*

EN 28960, *Refrigerators, frozen-food storage cabinets and food freezers for household and similar use — Measurement of emission of airborne acoustical noise* (ISO 8960)

FprEN 60704-2-14, *Household and similar electrical appliances — Test code for the determination of airborne acoustical noise — Part 2-14: Particular requirements for refrigerators, frozen-food storage cabinets and food freezers (IEC 60704-2-14)*

ISO 3055:1985, *Kitchen equipment — Coordinating sizes*

ISO 5149:1993, *Mechanical refrigerating systems used for cooling and heating — Safety requirements*

ISO 7000:2004, *Graphical symbols for use on equipment — Index and synopsis*

ISO 817, *Refrigerants — Designation system*

NF H35-124 (2006-07-22), *Industries de l'embouteillage — Bouteilles en verre — Bouteilles « Bordeaux tradition » 75 cl (indice de classement: H35-124)*

IEC 62552

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household refrigerating appliances – Characteristics and test methods

Appareils de réfrigération à usage ménager – Caractéristiques et méthodes d'essai

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD REFRIGERATING APPLIANCES – CHARACTERISTICS AND TEST METHODS

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.

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9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62552 has been published under the responsibility of IEC technical committee 59: Performance of household and similar electrical appliances.

It cancels and replaces International Standard ISO 15502 and its corrigendum (2005) prepared by subcommittee 5: Testing and rating of household refrigeration appliances of ISO technical committee 86, Refrigeration and air-conditioning, which was transferred to the IEC subsequent to IEC SMB decision 127/11.

The first edition of ISO 15502 cancelled and replaced ISO 5155:1995, ISO 7371:1995, ISO 8187:1991 and ISO 8561:1995, of which it constitutes a technical revision. It also incorporates the amendments ISO 7371:1995/Amendment 1:1997, ISO 8187:1991/Amendment 1:1997 and ISO 8561:1995/Amendment 1:1997.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The contents of the corrigendum of March 2008 have been included in this copy.

HOUSEHOLD REFRIGERATING APPLIANCES – CHARACTERISTICS AND TEST METHODS

1 Scope

This International Standard specifies the essential characteristics of household refrigerating appliances, factory-assembled and cooled by internal natural convection or forced air circulation, and establishes test methods for checking the characteristics. These are type tests, and because of this, when verification of the performance of a refrigerating appliance of a given type in relation to this standard is necessary, it is preferable, wherever practicable, that all the tests specified be applied to a single unit. The tests can also be made individually for the study of a particular characteristic.

NOTE   For the safety requirements applicable to household refrigerating appliances, see IEC 60335-2-24; for noise requirements applicable to household refrigerators and freezers, see ISO 8960; and for additional safety requirements applicable to the refrigerating systems of household refrigerating appliances, see ISO 5149.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 534, *Paper and board – Determination of thickness, density and specific volume*

ISO 817, *Refrigerants – Designation system*

IEC 60335-2-24:2002, *Household and similar electrical appliances – Safety – Part 2-24: Particular requirements for refrigerating appliances, ice-cream appliances and icemakers*

3 Terms, definitions and symbols

For the purposes of this document, the following terms, definitions and symbols apply.

3.1
refrigerating appliance
factory-assembled insulated cabinet with one or more compartments and of suitable volume and equipment for household use, cooled by natural convection or a frost-free system whereby the cooling is obtained by one or more energy-consuming means

NOTE   From the point of view of installation, there are various types of household refrigerating appliance (free-standing, wall-mounted, built-in, etc.).

3.1.1
compression-type refrigerating appliance
refrigerating appliance in which refrigeration is effected by means of a motor-driven compressor

3.1.2
absorption-type refrigerating appliance
refrigerating appliance in which refrigeration is effected by an absorption process using heat as energy source

3.1.3
refrigerator
refrigerating appliance intended for the preservation of food, one of whose compartments is suitable for the storage of fresh food